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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Cancer Broth

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A SCIENCE SERVICE PUBLICATION

GENERAL SCIENCE

Soviet Press Criticizes

RUSSIA'S INTENSIVE program to translate all the world's scientific literature is beset by troubles.

This is evident from two recent criticisms in the Soviet press made by members of the All-Union Institute of Scientific and Technical Information in Moscow—headquarters for the massive Russian translation effort.

The Russian critics of the Russian program charge that present translation methods are too costly, result in needless duplication and waste, and suffer from an acute shortage of trained personnel. The criticisms imply that there are serious weaknesses in Soviet foreign language training. They also pay a back-handed compliment to non-Russian scientific research.

Russian foreign language institutes should concentrate more on science and less on Shakespeare, charges N. Krinitsin, chief of the translation department of an Institute branch.

"Anyone who is in daily contact with translators who have attended the foreign language institutes," he says, "is confronted with their absolute helplessness in dealing with scientific and technical texts."

Mr. Krinitsin partially blames the faculties for this situation charging that although they are "well-grounded in the theory of language, (they) are impotent to handle scientific and technical terminology." He also lashes out against letting young specialists take any job they want, particularly those proficient in Oriental and other difficult languages.

Despite recent Russian successes in science, the translator warns Soviet scientists they cannot "as yet" ignore non-Russian research.

In this respect, he calls for special attention in the study of Oriental and uncommon Western languages, such as Czech, Hungarian, Dutch and the Scandinavian languages.

"When you look into foreign technical literature," he states, "you come to the conclusion that in some cases scientific and engineering thought is considerably more advanced in China, Czechoslovakia, Japan, Sweden and other countries than it is in the U. S. A., Germany or Great Britain."

A colleague, Ye. Pashkin, a senior scientific editor at the Institute, charges that bureaucratic ramifications have led to needless duplication of translations.

"It can be said without exaggeration," Mr. Pashkin asserts, "that this duplication costs the state tens of millions of rubles annually." (The official exchange rate is four rubles to the dollar). Another shortcoming, he notes, is the lack of qualified and systematic selection of foreign materials to be translated.

From the criticisms of both Mr. Krinitsin and Mr. Pashkin a picture can be drawn of some of the costs in rubles and talent of Russian scientific translation: The translation of 6,000 words of an "uncommon" language, such as Japanese, costs about 1,000 rubles (\$250). The same number of English or French words cost 600 rubles (\$150). It takes a non-scientist translator about one month to translate 18,000 to 30,000 words of scientific text.

The criticisms appear in *The Current Digest of the Soviet Press*, an American publication devoted to the translation of Russian articles.

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ASTRONAUTICS

Autopilot to Use "Book"

AN ELECTRONIC "reference book" for an automatic pilot to use while flying very fast aircraft and spacecraft has been designed by the Instrumentation Laboratory of the Massachusetts Institute of Technology.

These space age vehicles will encounter environmental changes far greater than men have previously mastered. Flight-testing robots to fly them will be time-consuming and costly. Several laboratories, therefore, have been seeking ways to make automatic pilots "self-adaptive" to a vehicle's capabilities in different environments.

The system proposed by H. Philip Whitaker, Joseph Yamron and Allen Kezer is described in the *Technology Review*, published at M.I.T. This system is intended to make the automatic pilots of the future "self-optimizing."

A self-optimizing person's work would be up to standard no matter how much or fast his working conditions changed. An automatic pilot can have a "performance reference model" to help it optimize its

work. By transmitting the same orders to this reference model that it is issuing to the vehicle, the automatic pilot can ascertain the differences in the ways the vehicle is responding and those in which it ought to respond. Then the automatic pilot, with this information in its wires, can so alter its adjustments and expectations that they will be adapted to the vehicle's capabilities in the environment at the instant.

"Suppose," the scientists suggest, "that you were cruising home from the moon at a satisfactory speed. Your ship would have to plunge from a near vacuum into an ocean of air that became increasingly dense. Its deceleration through this changing environment would have to be carefully controlled, but as you approached terra firma its responses to your guidance and application of the brakes would change. Your landing would be happier, certainly, if you could relax and leave the driving to a self-optimizing automatic pilot."

The performance reference model designed at M.I.T. can be prepared on the

ground, without flight tests, from the specifications of a new vehicle. This and other plans to make autopilots self-adapting are being tried out in aircraft now.

One important advantage of the MIT system over other proposed methods of improving autopilots for the space age is that the self-adaptor can be independent of the automatic pilot. This will prevent a failure in the self-adapting circuitry from knocking out the automatic pilot.

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PSYCHIATRY

Motive-Less Murderer Often Warns Early

TWO STUDIES of the mental workings and background of men, ordinarily law abiding and "normal," who suddenly "run amok" and murder someone were reported to the American Psychiatric Association meeting in Philadelphia.

In most of these cases of murder without apparent motive, the murderer actually reported to legal officials or psychiatrists before the murder that they feared they would lose control and kill. But the warning was disregarded.

So reported Drs. Joseph Satten, Karl Menninger, and Irwin C. Rosen, of the Menninger Foundation, Hospital and Clinic.

The murderers had a history of extreme parental violence in childhood. They generally stuttered or had speech difficulties in childhood. During their whole lives they had erratic control over aggressive impulses and periodic episodes of violence.

Examination of the murderer himself showed that he had difficulty in distinguishing between reality and fantasy and had a tendency not to feel angry or enraged in connection with aggressive action. Some showed ambiguous signs of organic brain damage. Such persons may pass as normal for a long time, but they are potentially dangerous and capable of great violence.

Drs. James M. A. Weiss, Joseph W. Lamberti and Nathan Blackman of Washington University School of Medicine, St. Louis, Mo., reported comparing 13 of such "sudden murderers" with 13 habitual criminals and 13 sex deviates.

In contrast to the habitual criminals who usually came from broken or troubled homes and early in adolescence began a continuous succession of crimes, and to the sex deviates who are generally introverted, insecure individuals, the sudden murderer is a lonely wanderer who feels isolated from people in general.

"When such persons seemed to be getting along quite well, when they could not blame others and when society seemed to expect them to be even more conforming and mature," the report stated, "these offenders became more and more tense and more and more angry. At such a time even a slight insult or provocation set off a violent surge of rage which resulted in murder."

"After the crime, the murderer most often gave himself up, admitted his guilt, and appeared bland, relieved, or even righteous."

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PUBLIC HEALTH

Paralytic Polio Soars

The first four months of 1959 have seen a rise in the number of persons stricken with paralytic polio, pointing to the importance of receiving vaccine shots.

ALMOST TWICE as many persons have been stricken with paralytic polio during the first four months of this year as during the same period last year, the U.S. Public Health Service has reported.

A total of 283 cases have been reported so far this year. In the same period last year, 147 had been reported.

Most of these cases occurred in "pockets" of the unvaccinated segment of the population, particularly among the lower socio-economic groups.

Dr. John D. Porterfield, acting surgeon general, cautioned that this early high figure is not necessarily an indication that the United States is headed for a severe polio season. The figures can and do vary a great deal.

The 1958 polio season witnessed a 45% increase in paralytic polio cases over 1957, he recalled. There were 3,000 paralytic polio cases recorded for the entire 1958 season. More than 300 of these were persons that had received the triple shot vaccine. Some

of these persons may have become infected before the series of shots was completed, PHS officials speculated.

During the first week of May, 19 new cases of paralytic polio were reported while data from the same week a year ago revealed seven cases.

"We are at least two months away from the polio peak and there is still time to reverse this upward trend if communities will push their drives forward at full speed," the acting surgeon general emphasized.

At least 50,000,000 persons in the high risk group, those under 40 years of age, have not received all three of their vaccine shots.

Surveys in which the PHS participated show that the larger percentage of the unvaccinated are in the lower socio-economic groups. Substantial numbers of persons at all economic levels still have not received three shots of the vaccine required for maximum protection, PHS data show.

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PUBLIC HEALTH

PHS Studies Polio Syrup

A POLIO syrup can become a reality in the not-too-far distant future.

But before it can be popped into the mouths of every man, woman and child in the world, it must hurdle at least five barriers to prove to the U. S. Public Health Service that it will not cause harm.

First of all, the polio syrup, unlike the Salk vaccine, contains attenuated polio viruses. This means that the viruses are alive. Tests to date have not established if the live viruses used in this newer vaccine can actually cause the disease in persons or whether it only builds up a sufficient supply of antibodies to ward off an attack of polio.

It is also unknown at this time if the virus can pass from vaccinated persons to the unvaccinated without causing the disease in the nonimmunized.

There are three types of polio virus. Each builds up its own protection system of antibodies within the body. The USPHS has not received sufficient evidence that all three types of virus can be combined successfully into one dose, Surgeon General Leroy E. Burney of the Service reports in the *Public Health Reports*.

Enough is not yet known about the effects on the polio viruses of other viruses normally found within the intestinal tract. These viruses may interfere with the development of immunity to polio.

Lastly, Dr. Burney points out, the exact meaning of results obtained from the popu-

lations that have been inoculated to date must be further studied.

The polio syrup type of vaccine has not been administered on a trial basis to any large body of persons in the United States

because a large portion of the population here has been immunized by the Salk vaccine, he explains.

However, studies are being conducted in Africa and Russia. At present, three separate batches are being studied. They are called the Sabin, Lederle, and Koprowski strains, named respectively for their developers, Dr. Albert Sabin of the University of Cincinnati, Lederle Laboratories, and Dr. Hilary Koprowski of Wistar Institute of Philadelphia. Dr. Herald Cox of the Lederle Laboratories is also associated with the Lederle strains.

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PHYSICS

President to Ask For Atom-Smasher

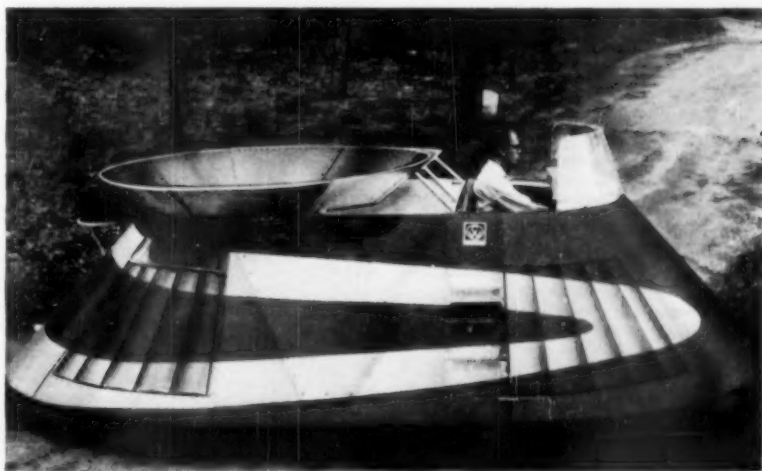
A GIANT, two-mile long linear accelerator, capable of producing electrons at energies of 10 to 15 Bev, may soon be under construction at Stanford University.

Addressing a symposium on basic research, President Eisenhower said that he would ask Congress to appropriate \$100,000,000 for the atom-smasher's construction. In a special report prepared by some of the nation's top scientists, emphasis was placed on the need for the new accelerator.

The powerful machine is needed, the scientists say, to study such things as the atomic nucleus, sub-atomic particles and antimatter. They recommend that construction begin before July 1, thus requiring Congressional approval within the next few weeks. Construction will take approximately six years. Operating expenses will be about \$15,000,000 a year, the scientists estimated.

The largest operating linear accelerator or "linac" now at Stanford is 220 feet long and produces electrons of 700,000,000 electron volts. Improvements in the proposed new linac are expected to enable it to reach as high as 45 billion electron volts or Bev.

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AIR-CAR—Using a conventional type piston engine of from 50 to 200 horsepower, the Curtiss-Wright Air-Car lifts itself from six to 12 inches off the ground. It has no conventional wheels, axles, brakes, clutches, transmission or frame. Low pressure, low velocity air supports and propels the vehicle over unobstructed ground or water.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

Aeronautica.—Esseva inventate (e construite) un aeroplano de cauchu que pote esser deflate e impaccate o inflate e rendite preste al uso intra alcun minutas. Su peso (sin combustibile) es 225 libras. Illo mesura circa 7 m ab extremitate de ala a extremitate de ala. In volo illo attinge un velocitate de circa 100 km per hora. Illo pote portar 240 libras, a parte le cargo de 180 libras de combustibile que suffice pro 6 horas e medie de activation. Le inflation es effectuate per le motor e mantenite a nivellos optimal (secundo le altitude del volo) per valulas in le alas. Le function practic del apparato es de character militar. In forma impaccate, illo pote esser attarate per paracadita pro salvar personal isolate in retro del lineas inimic.

Bacteriologia.—Esseva constatate al Universitate Denver que virus de typo bacteridica, quando culturate in culturas de bacterios antibiotico-resistente e postea transferite a culturas de bacterios antibiotico-sensibile, imparti a certes del superviventes inter le bacterios del secunde cultura le resistentia contra antibioticos que esseva characteristic del bacterios in le prime cultura. Virus non previeniente in contacto con bacterios resistente contra antibioticos non produce un tal effecto. Iste observation significa que virus pote transferir characteristics genetic ab un cellula al altere.

Nutrimientos.—In experimentos con ratts, scientistas al Universitate Ohio ha trovate que le rendimento caloric de amylo irradiate es plus alte que le rendimento caloric de amylo non-irradiate. Le irradiation rende le amylo plus completamente utilisabile per le organismo del ratts.

Geologia.—In laboratories in Russia Sovietic, mesurationes del comportamento de ferro e de varie altere metallas sub altissime pressionas ha producite nove factos que significa, secundo le interpretation de duo scientistas al Universitate California, que le centro del terra non pote consistir de ferro pur sed debe esser un mixtura de ferro con un o plure metallas minus pesante.

Statistica.—In le curso del passate 30 annos, plus que 2400 personas ha morite in inundationes in le Statos Unite. Le numero annual de mortes per inundation esseva generalmente infra 100. In 1931 illo esseva zero; in 1955, 302. Le valle del Ohio ha le plus alte mortalitate per inundationes. Un quarto del supra-mentionate total de 2400 mortes occurreva in ille region.

Statistica.—Le production mundial de cereales alimentari ha crescite phantasticamente in le curso del passate 20 annos. Pro le anno 1956/57, illo attingeva un total de 500 milliones tonnas. Tamen, le portion de cereales annualmente disponibile a omne individuo del racia human ha decrescite. Le ration de iste paradoxo es que nostre numeros ha crescite ancora plus phantasticamente que nostre production de cereales.

Ingenieria.—Le ancianissime projecto de un tunnel sub le Manica inter Francia e Anglaterra ha redevenite acute. Un convertite nave de guerra ha comenciate forationes submarin in le vicinitate de Dover pro determinar le plus favorable location del tunnel (si e quando illo es construite). Un aspecto interessante de iste labores exploratori es que le foramines effectuate per illos in le fundo del mar debe esser reclaudite con cemento pro evitar un influxo continue de aqua in le tunnel (de novo, si e quando illo es construite).

Ornithologia.—Certe aves de Florida meridional migra plus al sud in le autumn, in despecto del facto que le climate de ille region es semper dulce. Proque? Dr. A. Wetmore del

Institution Smithsonian a Washington considera como possibile que il se tracta hic de un atavismo, i.e. del supervivencia de un modo de comportamento que esseva functional 30 milles annos retro, durante le plus recente epocha glacial.

Genetica.—Le sensibilitate del gonades feminin vis-a-vis le effectos de irradiation ionisante varia grandemente con le etate del individuo. In experimentos con muses, recercatores al Laboratorios National Oak Ridge ha constatate que neonatas tractate con 300 roentgens (mesmo quando concentrate in tres o quatro minutas) se disveloppava in adultas de fertilitate normal. Del altere latere, adultas recipiente solamente 50 roentgens suffreva considerabilemente in lor fertilitate subsequente. Tamen, le observation le plus frappante in iste studios esseva que un radiation si debile que illo produceva nulle effecto del toto in le fertilitate de adultas esseva nonobstante satis forte pro destruer quasi complemente le fertilitate futur de juvene muses de un etate de inter un e duo septimanas. Iste constatation es particularmente inquietante proque le phase de disveloppamento que es attingite per le ovario de muses inter un e duo septimanas post nato corresponde in humanos a un phase de disveloppamento del ovario que es attingite ante le nascentia del individuo. Isto significa que a un periodo specific del gestation le irradiation de un femina pregnant pote causar le sterilitate futur del feto si illo es de sexo feminin.

Miscellaneous.—In areas urban, un domicilio typic es invadite omne septimana per circa duo libras de immundities que entra naturalmente via le fenestras e le portas.—Studios del magnetismo de ancian formationes de rocca indica que le polo del nord esseva a un tempore in le Pacifico Septentrional e que le equator (a ille mesme tempore) passava trans Espania e le Statos Unite.—Duo tertios del neonatos in omne partes del mundo es condemnate a sufferir maladias de malnutrition in le curso de lor vitas.

Immunologia.—Sex pueros e pueras, severemente ardite in un recente conflagration in un schola a Chicago, esseva resanate quasi miraculosemente per transfusiones de sanguine ab donatores qui illes mesme habeva suffrite sever ardituras in le passate recente sed qui habeva convalescite completamente ab illos. Iste methodo de tractamento esseva consiliate per Dr. S. R. Rosenthal, etiam de Chicago, super le base del theoria que ardituras resulta in le formation de toxinas le quales invade le corpore via le circulation de sanguine ubi illos evoca le formation de anticorpore. Si isto es correcte, il seque que quando un corpore es si severemente ardite que su production de anticorpore contra le toxina del arditura es inadequate, on pote adjutar lo per le infusion artificial de un typo de sanguine que contine un alte concentration del anticorpore in question. Dr. Rosenthal urge que su theoria es testate experimentalmente. Si illo es correcte, un conclusion plausible pare esser que on debe organiser bancas de sanguine ab donatores recentemente restabite ab sever lesiones de arditura.

Technologia Medical.—Ha essite disveloppate un camera de television montate in un casco que professores de medicina pote portar super le capite quando illes vole simultaneamente (1) examinar cavitates del corpore de un patiente (per exemplo le bucca, le aures, le naso, etc.) e (2) demonstrar lor constataciones a un gruppo de studentes.

Materiales.—Magnetes plus forte que magnetes de ferro e non perdente lor magnetismo a alte temperaturas esseva producite per le imixtion de oxydos metallic in ceramicos.

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GENERAL SCIENCE

Reading Interlingua

YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you had never had contact with any foreign language.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Dr. ALEXANDER GODE, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N. Y.

Financial contributions to the Interlingua program are needed.

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ASTRONAUTICS

Propose Moon Base

AS A FIRST step to building a permanent base on the moon, The Martin Company has proposed to the National Aeronautics and Space Administration a "lunar housing simulator" in which five men could live indefinitely.

One of the simulator's chief purposes, said Dr. James G. Gaume, head of Martin's space medicine work at Denver, Colo., would be to permit scientists to "close and balance" the ecological system of men, animals and vegetation so they can live harmoniously as a self-sustaining unit.

In doing this, scientists would seek the best ways to process all wastes from humans, animals and vegetables to obtain nutrients for plants and algae. They would seek to extract water from the sealed-in atmosphere and, after harvest, from chemical solutions in which plants had been grown. Dr. Gaume said getting water that way might be better than trying to recover it from human wastes, as has been proposed earlier.

The lunar simulator would be built of steel. It would consist of two spheres. The 32-foot-diameter inner sphere would be the space lab. This would be surrounded by a 55-foot outer sphere. The inner sphere would have half an atmosphere's pressure, about the equivalent altitude of 18,000 feet. (Mt. Everest is 29,000 feet high). The space between the two spheres would be at the near-vacuum atmospheric pressure equal to an altitude of 100,000 feet.

This roughly would correspond to space conditions. Men would enter the simulator through air locks in a long tube. The tube terminates at an elevator shaft. The ele-

vator would carry them to the inner sphere, which is supported on legs.

On the first floor would be mechanical equipment for processing wastes, extracting water and air conditioning. The second floor would be crew quarters having bunks, a kitchen, recreation room and library suitable for five men. The third floor would be the hydroponic farm where algae would be grown in chemical solution to replenish the air with oxygen; some small animals also would be installed on this floor. There would also be a small laboratory next to the elevator shaft that could be used to support the scientific work.

The fourth floor would be the hydroponic farm in which vegetables would be raised.

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CARTOGRAPHY

Survey Completes Large-Scale Maps of New York

THE GEOLOGICAL Survey has just published the last in a series of 28 large-scale maps of metropolitan New York City.

For the first time, the area has been completely mapped, topographically, at a scale of 1:24,000, or one inch to each 2,000 feet.

The latest map, the Central Park Quadrangle, covers about 60 square miles in the heart of the city, a tract representing seven and one-half minutes of latitude and longitude. Each previously published quadrangle in the series covers the same amount of area.

The area of the Central Park map includes Manhattan north of Pennsylvania Station, a section of northwest Queens in-

cluding most of La Guardia Field, most of Rikers Island, western Bronx, and Cliffside Park, Englewood and Fort Lee in New Jersey.

The five-color map depicts elevations, most schools, hospitals and important buildings; bridges and tunnels; streets, railroads, and many other detailed features.

By late 1960 the Survey hopes to publish seven composite maps compiled from the presently available 28 quadrangles. This is in line with its policy of producing what are referred to as city-and-neighborhood maps, for handier use.

The Central Park quadrangle, or any of the other 27 quadrangles covering metropolitan New York, are available at 30¢ each from the Geological Survey, Washington 25, D.C.

Other maps are also available. The Survey has said that only 40% of the country is adequately mapped. Consequently it is in the process of mapping the entire United States in one or the other of the two scales, 1:24,000 or 1:62,500. Only populated, industrial or other special areas will be mapped in the larger scale.

Index maps of each state, Hawaii and Puerto Rico, showing areas covered by topographic maps and at what scale, can be obtained free from the Survey.

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ASTRONOMY

New Device Records Star's Ultraviolet Light

ASTRONOMERS at Case Institute of Technology, Cleveland, Ohio, are using a new device, the first in the United States, to record ultraviolet light from faraway stars.

Called an ultraviolet prism, the device permits astronomers to analyze invisible radiations given off by stars 6,000 times as bright as the sun. The stars in which they are particularly interested are thousands of light years away in the outer spiral arms of the Milky Way galaxy, the gigantic pinwheel of billions of stars in which the sun, earth and other planets are located.

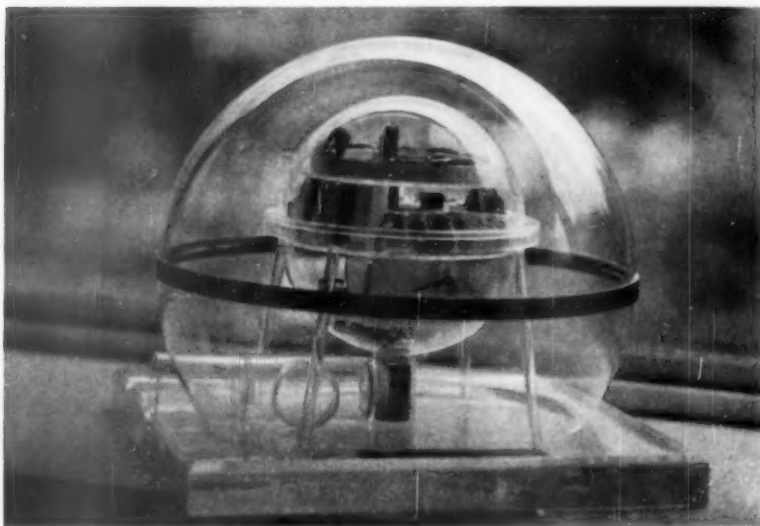
The National Science Foundation granted Case \$10,500 to purchase the device, which was made by the Perkin-Elmer Corporation. The prism is installed at the eyepiece of the Schmidt telescope located near Chardon, Ohio, reported Dr. Jason J. Nassau, Case's astronomy department chairman.

It will be used to study the "blue" stars, classified by astronomers as the OB group. Much of the radiation emitted by these relatively young stars, with ages measured in millions instead of billions of years, is in the ultraviolet range.

Ultraviolet rays are the part of the sun's light responsible for tanning skin.

The prism is two feet in diameter and weighs 72 pounds. It breaks up the star's radiations into a band of rays that can be photographed and studied. Very faint stars can be photographed using the device, so discoveries of previously unrecorded blue stars are expected.

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MODEL MOON BASE—The lunar simulator proposed by the Martin Company is shown in this model, in which can be seen the various floor levels, laboratories and work areas planned for the moon building. The outer sphere would have a 55-foot diameter while the inner sphere, the space laboratory, would have a 32-foot diameter.

BACTERIOLOGY

Staph Becomes Deadly

A possible explanation of how staphylococcal infection begins is seen in the discovery of the role coagulase plays in turning harmless "staph" into virulent ones.

THE ENZYME coagulase can turn harmless "staph" into deadly virulent bacteria.

For the first time it has been shown that when coagulase is mixed with strains of bacteria that do not usually produce disease, these bacteria then become virulent and produce infection, Dr. Richard Ekstedt of Northwestern University Medical School has reported.

It has never been understood just how a staphylococcal infection gets started in the body, Dr. Ekstedt told scientists at the Society of American Bacteriologists meeting in St. Louis, Mo. The type of staphylococci which produce disease also produce coagulase. The enzyme by itself is harmless to animal tissues. Now laboratory studies indicate that when a mixture of coagulase and harmless staphylococci is injected into mice, the animals quickly die of a fatal staph infection. The same bacteria injected alone had no effect.

The bacteria that cause staph infections—ranging from minor skin irritations to pneumonia—are generally present in the atmosphere. Many of them have become resistant to penicillin and other antibiotics, however, and have become a major problem in hospitals today.

This study may bring scientists one step closer to solving the problem of preventing and controlling these staphylococcal infections. Dr. William Yotis, also of Northwestern, is co-worker with Dr. Ekstedt.

In another report to the bacteriologists' meeting a practical test was described that makes it possible to identify the staphylococci that cause food poisoning.

The test may also be useful for the direct detection of the staph-produced poison enterotoxin in food, Dr. E. P. Casman of the Food and Drug Administration's microbiology division said.

There are at least two types of enterotoxin, he reported. However, only one type is associated with food poisoning.

Studies showed when enterotoxin was injected into rabbits an antitoxin was formed which reacts with and neutralizes the poison. A specific serological test for enterotoxin, the cause of the most common type of food poisoning known, is the result.

Undulant Fever Bacteria

THE MOST infectious form of the bacteria that cause undulant fever is the one that does the least damage to the body's white blood cells.

This finding seems to go against current theories of how these blood cells fight infection. It seems that the white blood cells may be "joining instead of fighting" the invading bacteria, Prof. Bob A. Freeman of the University of Chicago said. Damon

J. Kross and Richard Circo also worked on the study.

Various forms of the bacteria *Brucella* were grown in test tube cultures of white blood cells. *Brucella* cultures of low virulence—least infectious—caused almost complete destruction of the blood cells. However, Prof. Freeman reported, cultures of higher virulence showed very little destruction. This indicates that a fundamental character of virulent organisms is their capacity to infect and grow inside animal cells without causing the destruction of those cells, the microbiologist said.

It may be that the more virulent bacteria protect themselves against the body's defenses, such as the white blood cells, by their ability to live and grow within the host cells.

Drs. W. Stinebring and R. Kessel of the Institute of Microbiology at Rutgers University reported on similar studies. They grew *Brucella* bacteria in tissue cultures of guinea pig monocytes without finding signs of a reduced number of organisms. No changes were observed in the organisms recovered from the guinea pig tissue cultivation, the scientists said.

Trench Mouth Bacteria

MORE EVIDENCE has been reported that tiny spiral-shaped bacteria called spirochetes are the cause of trench mouth.

Ulcer-like lesions were produced in rabbits and guinea pigs by injecting them with cultured strains of the spirochetes. This is the first positive evidence that reproducible lesions can be started with pure cultures of these bacteria, two dental researchers from the National Institutes of Health, Bethesda, Md., reported.

Abscesses formed, Dr. Edward G. Hampp told scientists at the Bacteriologists meeting. He and his co-worker, Dr. Stephan E. Mergenhagen, were able to take spirochetes from the abscesses and use them to produce lesions in other animals.

Trench mouth, first recognized in soldiers, is an acute and ulcerative infection. It usually affects the gums but may extend to the lining of the cheek and larynx. Gums frequently bleed and brushing teeth is extremely painful. When the infection reaches the tonsil area, it is called Vincent's angina.

Previously numerous attempts had been made to produce experimental infections in animals with these oral spirochetes.

Dr. Hampp reported that he and his co-workers expect to study other oral bacteria that may play supporting roles with spirochetes in the production of oral diseases.

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PHARMACOLOGY

Tissue Culture Test Aids Anti-Tumor Drugs Search

See Front Cover

A RAPID, relatively low-cost testing procedure for detecting anti-tumor compounds has been developed by Irving Toplin at the John L. Smith Memorial for Cancer Research, Maywood, N.J.

In the photograph on the cover of this week's SCIENCE NEWS LETTER, a technician works on the test procedure. She places a nutrient broth containing human blood serum into a series of transparent plastic cups in which cells from human cancers are growing. Adding the test chemical to the broth enables researchers to measure its effect in inhibiting tumor cell growth.

The cells are incubated and then examined microscopically for signs of anti-tumor activity. Results from these tests have given the same results as those with laboratory animals. The method is relatively inexpensive.

The Smith Memorial is a research division of Chas. Pfizer & Co., Inc.

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PHARMACOLOGY

New Anti-Vomiting Drug Eliminates Side Effects

A DRUG that can prevent and control nausea and vomiting safely without causing sleepiness and other undesirable side effects has been developed.

The drug, called Tigan, has been found to successfully prevent and suppress vomiting and nausea in pregnancy, motion sickness due to land, air or sea travel, radiation therapy in cancer, drug-induced vomiting, upset stomach and other disease states, as well as in post-operative conditions, scientists reported at a clinical symposium in New York.

The compound is unrelated to other antiemetics now on drug shelves. It is not an antihistamine or a derivative of phenothiazine, drugs that achieve their effects by tranquilizing and sedation.

Tigan travels to the portion of the brain through which impulses are carried to the vomiting center. It has proven effective in more than 5,000 adult and child patients without producing the undesirable side effects associated with other antiemetic usage.

The drug has proved particularly valuable in radiation therapy with cancer patients, Dr. David W. Molander of the George S. Pack Medical Group, Cornell University Medical School and Sloan-Kettering Institute, New York, reported.

Tigan, a hydrochloride, is a stable, odorless, somewhat soluble white powder. It is available only on prescription. Dr. M. W. Goldberg and S. Teitel of the Hoffmann-LaRoche Laboratories successfully synthesized the agent.

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TECHNOLOGY

Invention Calms Waves

A FRENCH inventor has devised a method for inducing the waves of the sea to calm themselves with their own energy. One purpose of the method is the smoothing of harbor waters.

The invention makes use of devices known as hydraulic resonators, which in effect turn the waves against each other. The principle involved is that the crest of one wave and the trough of another of equal magnitude occurring at the same time and place tend to cancel each other out.

The resonators take a variety of shapes and forms, and in general they work in this way:

Regard them simply as long boxes with open bottoms extending below the sea surface and closed tops (open in some types) above the highest wave crests. At a given level in the sea, the water pressure varies as waves move along on the surface above; it is higher beneath the crests. The open bottom of the resonator experiences the pressure changes. When the pressure is high the water level in the resonator rises, and when the pressure drops the water level follows suit.

Thus, in the resonator there are constant rises and drops in water level and pressure, which create waves that advance out against

the incoming ocean waves. The resonator may be adjusted to produce crests and troughs at frequencies necessary to damp out the ocean waves.

The natural frequency, or period, of the resonator depends on its geometrical shape and the level of the water in it. There are ways of changing the natural period, which is necessary if the ocean-wave frequency changes from day to day. For example, the air pressure in the pocket above the water in the resonator can be reduced or raised, causing a decrease or increase in period, respectively.

Two or more resonators may be employed in calming harbor waters. They may be placed at the ends of protective piers extending into the ocean. A type of open-top resonator may be used as a "water elevator." Its shape causes the water in it to crest far above its usual level, and the water spills over into a collecting basin.

The inventor, Jean Valembois, Becon-les-Bruyeres, France, received patent No. 2,886,951, which he assigned to Electricite de France, a national service in Paris. The patent was one of several recently issued by the U.S. Patent Office.

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INVENTIONS

Most-Wanted Inventions

A "BUCK ROGERS" rocket device that can be worn by man to shoot him across rugged land, or to double as a parachute in case of airplane trouble, was one of the 28 most-wanted developments named by the National Inventors Council in an appeal to the nation's inventors.

The Council said it also is seeking pressure-sensing devices, and techniques for converting inedible products of the earth into edible food using invisible microorganisms. The object is to figure out a way for military personnel and civilians to "live off the land" if necessary, such as in an atomic war.

The Council, composed of distinguished civilian scientists and engineers and the heads of research of the Army, Navy and Air Force, serves as a liaison between the civilian inventor and the military. Since 1940, it has been capitalizing on the brainpower of the American public to solve military technical problems.

The armed forces also want a way to keep bread from hardening, a better fungicide for clothing, insect repellents that can be "built into" clothing, ways to stabilize muddy soils, a reliable long life cathode tube, and other devices.

Currently, damaged submarine communications cables must be fished out of the sea for repairs. Consequently, a method is wanted that causes sea water to react with some kind of exposed chemicals in the dam-

aged cables to make this portion of the cable rise to the surface.

A mechanism to measure angle of flight and cause deceleration at hypersonic speeds in the fringe of the earth's atmosphere, a method of using a rocket to check wind speeds up to 100,000 feet above the earth, and a device to measure the height of large water waves are also sought.

Inventors having solutions to any of the 28 new problems listed in the Council's "Supplement to Technical Problems Affecting National Defense," should write up the idea and send it to the Council. The suggested solution will be evaluated and, if it appears promising, will be turned over to the proper military agency for further evaluation.

The Council also cancelled 66 problems which it had named earlier. Among them were: Transparent cockpit enclosures, high-voltage power supply and components, chemical for melting snow or ice, machinery for fabrication and method of welding titanium and smokeless rocket propellents.

A Council spokesman said the cancellations did not necessarily mean solutions had been provided by American inventors. The project to which the problem applied may have been cancelled, he said, or the problem may have grown obsolete through advanced technology.

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THOREAU'S SEED PLANTS—Six portfolios of dried and mounted specimens collected by Henry David Thoreau, American philosopher and writer, have been given to the Harvard University Herbarium. Reed C. Rollins, director of the Gray Herbarium, studies a specimen.

ELECTRONICS

New Device Improves Voice of "Speechless"

AN IMPROVED artificial "voice" that uses electronic parts is under development for persons who have lost their voices through surgical removal (laryngectomy) or paralysis of their vocal cords.

Three scientists from Bell Telephone Laboratories, New York, told the Acoustical Society of America meeting in Ottawa, Canada, that the man-made larynx was made possible by transistors and miniaturization.

Still in the experimental stage, the device allows the user to control the pitch of his artificial voice, thus giving his speech a natural sounding quality not previously obtainable. It can be used with a minimum of difficulty and training, and is especially effective when conversing over the telephone.

Underlying principle of the artificial larynx is a vibrating driver (transducer) held against the throat. Self-contained and cylindrically shaped, it measures slightly less than two inches in diameter and slightly more than three inches long. Included in the package is a modified telephone receiver serving as a throat vibrator, an efficient transistorized pulse generator with pitch control and a battery power supply.

To use the unit, the laryngectomized person presses the vibrator against his throat. Switching on the pulse generator with his finger, he transforms vibrations transmitted into his throat cavities into speech sounds as if he were speaking normally.

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OCEANOGRAPHY

Bathyscaph Gets Set For Ocean Probes

A DEEP ocean diving bathyscaph, the Trieste, from the Navy Electronics Laboratory, San Diego, Calif., is in operation following four months of reconditioning which equips the craft for ocean probes as deep as 20,000 feet.

The Trieste, piloted by Jacques Piccard, who with his Swiss father Auguste Piccard designed and built the craft, made two dives in the Atlantic to 10,500 feet before the craft was brought to the Laboratory last December, test dived, and dry-docked for repairs.

Dr. Andreas B. Rechnitzer, NEL scientist in charge of the bathyscaph, described the miniature blimp-like craft as the "Model T" of future submarines.

Dr. Rechnitzer and Mr. Piccard are beginning a series of 3,600-foot shakedown and testing dives seven to 12 miles off the San Diego coast. After these shakedown exercises are over the research submersible will probe the San Diego trough which is 40 miles off shore.

After exploring the San Diego trough which is about 6,500 feet deep, the Trieste will be in for newer and bigger things. It will search ocean depths down to 20,000 feet, exploring the sea floor, ocean characteristics at various sea levels, thermodynamics, and the ocean's deep scattering layer—a layer that sometimes causes refraction of acoustics under water, believed caused by marine life.

Acoustical studies may help achieve a breakthrough in extremely long-range detection of enemy submarines, which is one of the Navy's serious defense problems.

After being reconditioned, the 70-ton bathyscaph was weighed prior to its "re-launching" to determine its new displacement. Then it was loaded by hand with nine tons of iron buckshot ballast. Its hull holds 28,000 gallons of aviation gasoline.

This gasoline, which is 30% lighter than water, provides positive buoyancy, like gases do in balloons. The iron ballast can be jettisoned like a balloon's sand bags.

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METEOROLOGY

Look to Ozone for Better Weather Forecasts

WEATHERMEN at the U.S. Weather Bureau hope to find a way to improve weather forecasts through measurements of ozone in the air.

Ozone is a form of oxygen especially noticeable by its "clean, fresh" smell right after a thunderstorm. In heavy concentration, however, it is poisonous to man and may be a potential threat to our high-flying military airplanes as well as their crews. Ozone attacks rubber and can convert oil ultimately into a gummy mass.

It is already known that variations in ozone in the air correlate with weather. For instance, a drop in ozone concentration appears often before a storm. Weathermen hope to find close and reliable correlations

of ozone and weather that might be used, some day, to improve 24-hour forecasts.

Supported also by the U. S. Air Force, Navy and Atomic Energy Commission, the project has as its immediate goal the expansion of a network of seven stations to measure ozone routinely.

(The Atomic Energy Commission is interested because it sees the possibility that ozone movements might yield data on the speed of radioactive fallout following bomb tests.)

Tests have been completed in Denver, Colo., on several ground and balloon-borne instruments that might be used to gather data about this faintly bluish gas. An ozone layer high in the atmosphere protects us from the sun's skin-burning ultraviolet rays.

Ozone is found at ground level, but reaches its heaviest concentration at an altitude of 60,000 to 110,000 feet. At present there are few ozone stations throughout the world. The U. S. has only five: Caribou, Me., Green Bay, Wis., Bismarck, N. D., Washington, D. C., and Mauna Loa Observatory, Hawaii. Two new U. S. stations are to be at Nashville, Tenn., and Fort Worth, Texas. A temporary station, at the South Pole, might become a permanent eighth station.

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ENGINEERING

Device Uses Satellites To Rescue Lost Craft

A DEVICE using space satellites to hunt down and rescue lost vehicles has been proposed.

Known as SARUS, Search and Rescue Using Satellites, the device is designed to search out and find almost any type vehicle within one mile of its location. Among rescued vehicles might be missile nose cones, space capsules or conventional aircraft and ships.

The system would provide such vehicles with a subminiature radio transmitter to send out signals in time of trouble. Only a few milliwatts of power on an international distress frequency in the Ultra High Frequency range would be required.

Satellites circling in a polar orbit a thousand miles above the earth would receive the distress signals and record them for later transmission to ground stations.

The satellites would also be able to measure the relative frequencies of the signals. The rate of change of the frequencies would provide the information necessary to find the location of the sought vehicle in relation to the satellite.

Stations at fixed points on the ground could pick up any information the satellites had recorded as the satellites came within radio range. By knowing the exact location of the satellite, as provided by recorded time signals, analysis of frequency data could locate the sought vehicle within a mile.

SARUS was described to the Institute of Radio Engineers meeting in Albuquerque, N. M., by Frank W. Lehan of Space Electronics Corporation, Glendale, Calif.

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IN SCIENCE

PUBLIC HEALTH

New Textile Finish Makes Fabric Antibacterial

A HANDKERCHIEF that can fight off bacteria—even the antibiotic-resistant staphylococcus—will soon be on the market.

The handkerchief, which was introduced at the fall show in New York of the National Association of Men's Sportswear Buyers, contains a permanent antibacterial finish called Eversan. In this finish an organic zinc ingredient is said to be fixed to the textile fibers, making the fiber molecules permanently antibacterial.

In a seven-year testing and development program, Eversan was found to inhibit the growth of many bacteria, including those that cause odor. Eversan was developed by Ions Exchange & Chemical Corp., and its distribution in the United States is to be handled by Yardney Chemix Corp., New York. It is claimed that the finish is odorless and does not affect fabric color, nor does it impart a color of its own. Tests indicate it is non-toxic and non-irritating in normal use.

Eversan is said to remain effective "beyond the life of any garment fabric" and to withstand repeated near-boiling water washes with detergents and bleaches, including chlorine.

It is planned to use Eversan in hospital sheets, pillow cases and towels. It will also be available for individual buyers. Eversan has been tested successfully on underwear, knitted goods, work clothes and sweaters, as well as on "wash and wear" garments.

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GEOLOGY

Tangue Found "Non-Conforming"

TANGUE, a very fine powder with a high concentration of calcium carbonate found close to the coast near Mont Saint Michel, France, is a "non-conforming" sediment, two French geologists report.

Tangue has been used for many generations as a fertilizer along considerable parts of the French Atlantic coast, especially in Brittany. It is "non-conforming" because the size distribution of grains is contrary to the distribution observed normally in other sediments. Instead of becoming smaller as measurements are made farther from shore, sizes of the grains increase toward shore.

The calcium carbonate in tangue comes from offshore oyster banks. Prof. Jacques Bourcart and Roger H. Charlier of the University of Paris report in the *Bulletin of the Geological Society of America* (May). One remarkable property of tangue is its silvery-pearly gray color.

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THE FIELDS

CONSERVATION

USDA Research Improves Water Problem In West

SEVENTEEN MINUTES is all it takes to turn a dry streambed into a torrent, with 20,000 cubic feet of water tearing by each second.

This is one of the problems—flash floods—being studied by its scientists, the U. S. Department of Agriculture has reported. Research conducted at Tucson, Ariz., by USDA experts points to several possible ways of recovering water normally lost in flash floods. Suggestions include: 1. small storage reservoirs, 2. storage of water underground, and 3. improved vegetation.

Small storage reservoirs located on the tributaries of larger streams could mean a "relatively high degree of water recovery," Robert V. Keppel and Joel E. Fletcher said. This is due to the prevalence of small local showers with large losses of runoff in normally dry streambeds. Thunderstorms near Tucson were usually less than one mile and one-half in diameter, they said, with most of the water falling from a cloud area about half this size.

Underground storage of water, where evaporation losses are the least, is being given increased study in long-range water planning for the West.

Runoff can be further reduced by changes in vegetation, the USDA scientists explained. Plants decrease surface "puddling" and can thus increase the rate of water infiltration into the soil, recharging underground water storage areas.

USDA studies indicate less than five percent of the rain running off southwestern rangelands ever reaches a point downstream where it can be put to use. With populations continuing to rise, the short water supply situation is becoming more acute.

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PHYSIOLOGY

Unborn Babies Create Own Sea Level Conditions

UNBORN BABIES that are carried by women that live in high altitudes create "sea level" conditions for themselves, a team of six doctors has discovered.

At high altitudes, oxygen, vitally needed by the unborn baby, is not as abundant in the air as it is closer to the lower levels of the earth. Therefore, the baby, to survive until time of delivery, creates a larger supply of oxygen for itself by enlarging its mother's placenta. This is the organ within the uterus that establishes a connection between the mother and baby by means of the umbilical cord which carries nourishment and oxygen between them.

An expedition, headed by Dr. Donald H. Barron of the Yale School of Medicine, went to Peru to study the problem of pregnant

mammals who have difficulty supplying oxygen to the unborn fetus.

They presumed that the problem would be automatically magnified at higher altitudes where oxygen becomes scarce.

At sea level, the greatest single cause of death among infants at or about the time of birth is fetal anoxia, an insufficient supply of oxygen.

The investigators learned through detailed laboratory experiments with pregnant sheep and llamas that a fetus in an atmosphere of rare oxygen is capable of enlarging the placenta to receive oxygen from his mother.

The researchers emphasized that their study was limited to the unborn fetus only and did not extend to a further study of the baby during the actual process of birth or after.

The scientists conducted their study at the Institute of Andean Biology in Morococha, 15,000 feet above sea level. In addition to Dr. Barron, Drs. James Metcalf of the Harvard Medical School, William Huckabee of Boston University Medical School, Andre Hellegers of Johns Hopkins Medical School, Harry Prystowsky of the University of Florida Medical School and Giacomo Meschia of Yale participated. Dr. Alberto Hurtado, director of the Institute and dean of the Medical School of the National University of San Marcos, Peru, assisted.

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ASTRONOMY

Supernova's Light Due To Radioactive Iron

THE LIGHT of a supernova, a star that suddenly blazes forth at more than a million times its previous level, may be due to iron, not the artificial element, californium-254.

Dr. Edward Anders of the University of Chicago's chemistry department and Enrico Fermi Institute for Nuclear Studies proposes the iron-group theory to account for the observed falling-off rate of a supernova's light. His theory disagrees with one proposed about three years ago by five astronomers.

They suggested that californium-254, made when supernovae explode, is responsible for the supernova's dwindling light. Californium-254 is heavier than uranium and, like uranium, spontaneously breaks up, half of any given amount disappearing in about 55 days. This same period of 55 days is observed in the decreasing light curves of supernovae.

Dr. Anders suggests the declining light is due to the breakup of iron-59, which takes 45 days for half of any amount to disappear. This picture, he says, can account for the build-up of both the light and heavy elements in about the same proportions as found in the solar system, unlike the theory of the five astronomers.

The synthesis of elements of the iron group in a supernova is a theory proposed by Dr. Fred Hoyle, now at Harvard College Observatory. Dr. Anders' theory is outlined in detail in the *Astrophysical Journal* (March).

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BIOLOGY

Extinct Sea Life Hunted by Scientists

TRILOBITES, crab-like creatures that inhabited the oceans 500,000,000 years ago and considered extinct in today's textbooks, are objects of an intense search that is getting under way by scientists of the Scripps Institution of Oceanography.

The scientists who will make the living fossil hunt are Robert H. Parker, a Scripps ecologist, and Dr. Henning Lemche, a zoologist from Denmark. They do not believe the trilobite is extinct and are planning to go out and look for the organism. They hope to bring living specimens back and breed little trilobites in a laboratory.

If they can find this living fossil, they may be able to push back the knowledge of how life got started on this earth by millions of years.

The Scripps scientists are optimistic about finding trilobites, based on the fact that ocean creatures called "neopilina," once believed extinct, were dredged up out of the Gulf of California. They believe if neopilina can be found, so can trilobites.

The wrong places may have been searched for living fossils in the past. Although some old, dead fossils have been shallow-water residents (found in ancient sediments that have turned to sandstone), neopilina and other fossils once thought extinct were found from 1,200 to 12,000 feet down on the continental slopes or underwater mountain sides. It is believed that they were crowded out of shallow water by other animals and found less competition on the deeper slopes.

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PHYSIOLOGY

Chemical Helps Preserve Frozen Living Tissues

A NEW METHOD for preserving frozen red blood cells, both human and cow, has been reported.

The chemical dimethyl sulphoxide promises more effective protection against the damaging freezing-thawing process than several other compounds, say J. E. Lovelock and M. W. H. Bishop of the National Institute for Medical Research, Mill Hill, London. Previously it had been found that glycerol and "other neutral solutes" prevented freezing damage to living cells.

The researchers found that dimethyl sulphoxide penetrates the red blood cell more quickly and less is needed for complete protection against freezing. For example, they pointed out, two hours with glycerol before freezing gave poor protection to both cow and human red blood cells. However, only 30 seconds with dimethyl sulphoxide gave complete protection.

The compound should be useful for preserving living tissues that are not now protected by glycerol treatment, the researchers conclude in *Nature* (May 16).

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PSYCHOLOGY

Americans Working Abroad

Americans working abroad normally experience a certain amount of "separation anxiety" and anxiety about the unknown. These anxieties may interfere with efficiency.

By RICHARD LITELL

THE AMERICAN working abroad is more likely to encounter emotional problems that might interfere with the efficiency of his work than his countryman who remains at home.

However well-adjusted he may have been in his own land, he will develop, to a greater or lesser extent, two main anxieties upon reaching his foreign post. One is "separation anxiety" (anxiety about separation from home and the familiar); the other is anxiety about the unknown.

The degree to which he can overcome these anxieties represents the degree to which he can successfully adapt himself psychologically to his new environment and carry out his assignment.

Because of the rapidly growing number of Americans working overseas and the increasing importance of their work, study of their mental health, what endangers it and what enhances it, is vital as never before.

Overseas Influx

In 1938, there were only 1,218 Americans in the Foreign Service working abroad and another 1,079 working overseas for all other Federal agencies. By May, 1956, there were 34,052 Americans working abroad for Government agencies other than the military—about 15 times the 1938 total.

There were more than 100,000 American civilians working abroad on a full-time basis for international organizations in 1956, approximately divided as follows:

Government and	
Government Contracts	37,000
Missionary Work	28,000
Business	24,000
Students	10,000
Teachers and Scholars	1,500
International Groups	3,000
Miscellaneous	1,000

In addition, there were probably another 30,000 U. S. citizens who went abroad on short-term business, private or governmental. None of these figures includes the wives or dependents of personnel at work abroad.

Dr. Dana L. Farnsworth, president of the Group for the Advancement of Psychiatry, has said that "in these critical times, when the United States has committed itself to a policy of international responsibility, the mental health of the American working overseas appears to be of even more critical importance than it is at home."

This, he says, is because of its effect on the vital program the man is responsible for carrying out.

The GAP has recently issued a report on the special psychological problems of persons working in foreign lands, as well as recommendations on how these problems may be met. Entitled *Working Abroad: A Discussion of Psychological Attitudes and Adaptation in New Situations*, it was prepared by the organization's Committee on International Relations under the chairmanship of Dr. Bertram Schaffner, New York psychiatrist.

The primary concern of the GAP report is not with the relatively small group of Americans who fail to adjust to life and work abroad, but with the larger group of persons who, though frequently very competent in their special fields of work, cannot function well in special situations that arise when they live outside their accustomed environment.

Incentives to foreign work are many. It offers an opportunity for personal achievement, escape or variety. Some persons get satisfaction out of the particular work accomplished or its relation to special interests, such as foreign affairs, economics, history or language.

Others enter overseas employment out of humanitarian or patriotic motivations, while still others seek higher salaries or pensions, or rewards in the form of honor, status and prestige.

Since the majority of persons go abroad of their own free will to live and work, the rewards of working overseas are obvious and real to those who choose to go.

But despite the rewards and satisfactions, there are stresses too.

The foreign situation itself causes some of the difficulties. There are often conflicts with values, ideas and customs of peoples or co-workers of foreign lands; inequalities of privilege and opportunities, and more difficult and limited personal relationships with one's fellow countrymen while abroad.

Certain climatic and geographical locations may also be a source of stress.

Individual Adjustment

Lately there is more general recognition that the causes of difficulty in adjustment to overseas living may lie within the individual himself. Emotional difficulties may have troubled him to a certain degree at home, for example, but abroad they may become accentuated and harder to reconcile.

The GAP report incorporates a number of recommendations for coping with the growing problem of mental health among the expanding ranks of Americans employed abroad.

It points out that many of the problems of adaptation should be handled before the

individual is sent overseas, and that human relations involved in work abroad, long neglected, should be stressed. It also emphasizes the need for orienting not only the man but his wife and family as a single unit.

Employers should pay more attention to the mental health of the prospective employee, even though it may sometimes mean lowering the technical requirements for the job.

Recent experience suggests that sending the right kind of person is so vitally important that it is worthwhile to lower technical requirements on occasions, even better at times not to fill the job at all, than to send someone well-trained but likely to fail on a personal basis or cause embarrassment in his public relations.

The group also recommends the establishment of a foreign service training center to coordinate the research now being carried out by various Government agencies, universities, industries, religious and private welfare organizations.

Such a center could provide a setting for training, consultation and research. It should be accessible to all Governmental, industrial, public and private personnel, including foreign personnel working in the U. S. It should serve as a clearing house, enabling all the individuals working in this field to profit from each other's experience, instead of doing overlapping jobs.

Training Center Needed

The center should also introduce into the entire range of overseas activities, concepts bearing upon individual and social psychology. It should teach principles of mental health and cover such matters of agency policy as selection, pre-departure orientation, life overseas and the employee's return home.

When separation anxieties and other emotional problems become so great that ordinary environmental support and understanding human contacts are insufficient, it is necessary to seek other sources of help, the report states.

At this point it is desirable to have a competent psychiatrist clarify the problem for both the individual and the administrator, and to determine methods of treatment or whether the individual can stay on the job.

A certain degree of separation anxiety and fear of the unknown is a natural, expectable occurrence in persons going into overseas work. Although it presents an emotional problem that can cause much trouble if not understood or well handled, it can be assuaged by non-judging understanding and ease of communications between all persons concerned. This does not imply coddling, but rather correct remedial measures in specific situations.

Those who have worked well and happily overseas are generally possessed of

flexibility, personal ability, social maturity and "social inventiveness."

Maintenance of these characteristics together with sound mental health is essential for the overseas worker to perform efficiently.

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BACTERIOLOGY

Double Dose Antibiotics Kill Bacteria in Cells

ANTIBIOTICS can be used successfully against bacteria growing within living body cells.

Research reported by a Michigan State University scientist supports the theory that bacteria growing in cells in a laboratory tissue culture and bacteria growing in cells in the body are similarly affected by drugs.

A tissue culture technique for determining how great an effect drugs have on undulant fever (brucellosis) bacteria when they are growing within the cell was described to the Tissue Culture Association meeting in Atlantic City, N. J., by Dr. Marvis A. Richardson. The same technique, she said, can be applied to other diseases caused by organisms which grow within the cell, such as tuberculosis, leprosy, typhoid fever, malaria and many fungal diseases.

Undulant fever is characterized by an initial rise in temperature which falls as bacteria in the blood are killed and then rises as those within cells reproduce and their "offspring" enter the blood.

The M.S.U. microbiologist grew cells from various organs of the cow in test tubes and then exposed them to brucellosis bacteria.

As they do in humans and animals, these bacteria grew within the cell. This makes them hard to kill. Normal body defenses or antibiotics will readily inhibit brucella in the blood but not those within cells. However, Dr. Richardson found that very high concentrations of either penicillin or streptomycin kill some of the bacteria within the cells.

But a much greater kill, she also found, occurs when the two antibiotics were given together even though the dosage of each one was too small to have any appreciable effect by itself. Such a combination of drugs is known to be effective against many diseases.

This test is believed to be the first to show the degree of effectiveness of antibiotics against organisms growing within cells. One other test indicates if an antibiotic is effective against tuberculosis infection but does not reveal the degree of effectiveness.

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Do You Know

Practically all cotton imported into the Philippines is from the U.S.

Each year more than 12,000,000 anesthetics are administered in the U. S.

Copper enzymes in the body speed up oxidation of oxygen from the air.

MEDICINE

Treating Snake Bites

SUMMER is the season for increased outdoor activities, and snake bites.

The number of such victims may increase as outdoor activities such as camping become more popular, two Philadelphia physicians warn.

Most cases of snake bite occur in the southern and southwestern states where there are more snakes and the conditions favor greater exposure. However, all states except Maine and Alaska harbor poisonous snakes.

Therefore, all physicians must be prepared to treat poisonous snake bites, Drs. Thomas McCreary and Harold Wurzel of the Hospital of the University of Pennsylvania, remind colleagues in the *Journal of the American Medical Association* (May 16).

As many as 3,000 snake bites per year have been estimated for the United States alone. Only 10 to 20 of these prove fatal, however.

There are at least 35 species or subspecies of poisonous snakes in this country, the doctors point out. Most of these are pit vipers or Crotalidae, which include the

many species of rattlers, the copperhead and the cottonmouth or water moccasin. The coral snake, found in southern states, is a relative of the cobra and is not a pit viper.

The Crotalidae are generally nocturnal in their habits and are dangerous on land or in water. Yet, they are not aggressive and only strike for food or in self defense when endangered or attacked.

The doctors listed a number of factors that affect the seriousness of a snake bite. They include:

1. age; the young and old are more susceptible to serious aftermath.

2. site of the bite; snake bites are less dangerous on an extremity than near a vital organ.

3. early treatment; the earlier, the better.

Their advice for the victim that is bitten far from a doctor's office includes the application of a tourniquet (to close off the superficial lymphatics to lessen the spread of the venom), incision and suction at the site of the bite, and a dose of antivenin from a physician when available.

Science News Letter, May 30, 1959

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ADOLESCENT RORSCHACH RESPONSES: Developmental Trends from Ten to Sixteen Years—Louise Bates Ames, Ruth W. Metraux and Richard N. Walker—*Hoeber*, 313 p., \$8.50. This new volume from the Gesell Institute of Child Development provides detailed longitudinal study in Rorschach responses of 100 children.

ANALYSIS OF LINEAR SYSTEMS—David K. Cheng—*Addison-Wesley*, 431 p., \$8.50. Textbook written at the advanced undergraduate-graduate level.

ANNOTATED BIBLIOGRAPHY OF APPLIED PHYSICAL ANTHROPOLOGY IN HUMAN ENGINEERING—Robert Hansen and Douglas Y. Cornog, H. T. E. Hertzberg, Ed.—*Wright Air Dev. Center (Off. of Tech. Serv.)*, 301 p., illus., paper, \$5. Condensations of 121 reports.

AN ANTHROPOLOGICAL RECONNAISSANCE IN WEST PAKISTAN, 1955, with Appendixes on the Archaeology and Natural History of Baluchistan and Bahawalpur—Henry Field—*Peabody Mus.*,

332 p., 144 fig., \$12.75, paper: \$9.75. Report on results of expedition probing the prehistory, early history and physical anthropology of the region.

ASTRONOMY—Theodore G. Mehlin—*Wiley*, 392 p., illus., \$7.95. Elementary college course, with each section preparing the student for a logical development of the following topic.

BIBLIOGRAPHY OF MONOLINGUAL SCIENTIFIC AND TECHNICAL GLOSSARIES, Vol. II: Miscellaneous Sources—Eugen Wuster—*Unesco (Columbia Univ. Press)*, 146 p., paper, \$2.50. Refers to 1,043 privately published glossaries and dictionaries in 26 languages.

BIOGRAPHICAL MEMOIRS, Vol. XXXIII—Edmund W. Sinnott and others—*Columbia Univ. Press for Nat. Acad. of Sciences*, 484 p., illus., \$5. Biographies, portraits and bibliographies of deceased members of the Academy.

CHARLES DARWIN—Sarah R. Riedman, introd. by Bert James Loewenberg—*Holt*, 192 p., \$3. Biography for teen-agers.

CONCRETE, THE VISION OF A NEW ARCHITECTURE: A Study of Auguste Perret and His Precursors—Peter Collins—*Horizon Press*, 307 p., 173 photographs, \$12.50. Describes development of a new building material and the efforts of various architects to find its most appropriate form.

A COURSE OF PURE MATHEMATICS—G. H. Hardy—*Cambridge Univ. Press*, 10th ed., 509 p., paper, \$3.75. Reprint of indexed edition.

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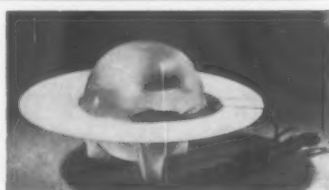
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ENCYCLOPEDIA OF CHEMICAL REACTIONS, Vol. VIII: Tungsten, Uranium, Vanadium, Ytterbium, Yttrium, Zinc, Zirconium & Addenda—C. A. Jacobson, Compiler, Clifford A. Hampel, Ed.—*Reinhold*, 533 p., \$14. In this final volume sequence system has been changed, entries are arranged in alphabetical order of chemical symbols.

ESSENTIALS OF CHEMISTRY—Alfred Benjamin Garrett, Joseph Frederic Haskins and Harry Hall Sisler—*Ginn*, 2nd ed., 608 p., illus., \$7. Introductory college textbook.

EXCAVATIONS AT LA VENTA TABASCO, 1955—Philip Drucker, Robert F. Heizer and Robert J. Squier—*Smithsonian Inst. (Govt. Print. Off.)*, 312 p., illus., \$4. Report of archaeological expedition at the Olmec site in Mexico.

501 QUESTIONS AND ANSWERS IN ANATOMY—Stanley D. Mirovian, introd. by Ernest V. Enzmann—*Vantage*, 332 p., \$5. Reference text for medical, osteopathic and dental students, and others preparing for Licensure State Board Examinations.

GRENFELL OF LABRADOR—George H. Pumphrey—*Dodd*, 171 p., illus., \$3. Biography of the English physician who devoted his life to better the health and living conditions of the Eskimos of Labrador.

HOW TO HELP YOUR CHILDREN: The Parents' Handbook—William C. Menninger, Ashley Montagu, Paul Witty and others—*Sterling*, 640 p., illus., \$4.95. Advice from experts on the child's social and psychological development.

IES LIGHTING HANDBOOK: A Standard Lighting Guide—*Illuminating Eng. Soc.*, 3rd rev. ed., more than 1,000 p., illus., \$10. Essential information on light, vision, measurement and color, lighting calculations and applications in public buildings, industries, sports, roads, aviation and photography.

JUST BEFORE DARWIN: Robert Chambers and *Vestiges*—Milton Millhauser—*Wesleyan Univ. Press*, 246 p., illus., \$4.50. Story of the amateur scientist of Edinburgh and his anonymous book on the "development thesis," *Vestiges of the Natural History of Creation* (1844). Notes and bibliography included.

MAN'S WAY: A Preface to the Understanding of Human Society—Walter Goldschmidt—*World Pub. Co.*, 253 p., \$4. Anthropologist's analysis of man's cultural and social development.

MICROBIOLOGY—Louis P. Gebhardt and Dean A. Anderson—*Mosby*, 2nd ed., 476 p., illus., \$5.75. Essentials of microbiology for the general student and the prospective high school and junior college science teacher.

MINERAL AGGREGATES, 1958 Revision: Annotated Bibliography 23—J. F. McLaughlin—*Highway Res. Bd.*, 111 p., paper, \$2.20. Indexed by subject and by author, covers field till end of 1956.

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1001 QUESTIONS ANSWERED ABOUT TREES—Rutherford Platt—*Dodd*, 318 p., drawings and photographs by author, \$6. Facts about famous trees and tree statistics, forestry, tree products, pests and diseases, fully indexed.

PHYSIOLOGY OF INSECT DEVELOPMENT—Frank L. Campbell, Ed.—*Univ. of Chicago Press*, 167 p., illus., \$4. Developmental Biology Conference Series volume, reviewing findings from studies which employed insects as subjects for genetic research, studies of hormones, nutrition and metabolism.

PLANE TRIGONOMETRY—A. W. Goodman—*Wiley*, 267 p., illus., with Tables \$4.50, without Tables \$3.75. Text arranged in the historical and natural order, combining the modern and classical views.

THE REPORT OF THE UNITED STATES PUBLIC HEALTH MISSION TO THE UNION OF SOVIET SOCIALIST REPUBLICS: Including Impressions of Medicine and Public Health in Several Soviet Republics—U. S. Dept. of HEW (Govt. Print. Off.), 67 p., illus., paper, 45¢. Findings of five U. S. doctors visiting the USSR late in 1957.

RUDIMENTS OF WEATHER: The Story of Our Energetic Atmosphere—John A. Day and Fred W. Decker—*O.S.C. Coop. Assn.*, 2nd ed., 97 p., illus., paper, \$2. Examines weather phenomena in the light of the integrative theme of energy and its transformation.

SECOND CONFERENCE ON CO-ORDINATION OF GALACTIC RESEARCH—A. Blaauw and others, Eds.—*Cambridge Univ. Press*, 93 p., illus., \$3. Symposium No. 7 of the International Astronomical Union.

A SHORT COURSE OF ORGANIC CHEMISTRY—John E. Leffler—*Macmillan*, 201 p., illus., \$5.50. One-semester course primarily for students majoring in fields other than chemistry.

A SHORT INTRODUCTION TO ANATOMY (Isagogae breves)—Jacopo Berengario da Carpi, transl. from Latin, introd. & historical notes by L. R. Lind, anatomical notes by Paul G. Roofe—*Univ. of Chicago Press*, 228 p., illus., \$5. Sixteenth century treatise of interest to the medical-anatomical historian.

SILICONES—R. N. Meals and F. M. Lewis—*Reinhold*, 267 p., illus., \$5.95. On the manufacture, properties and applications of the silicones, with data on the properties of silicone resins, fluids and rubbers at high temperatures.

SOCIAL CONTROL AND THE FOUNDATIONS OF SOCIOLOGY: Pioneer Contributions of Edward Alsworth Ross to the Study of Society—Edgar F. Borgatta and Henry J. Meyer, Eds.—*Beacon Press*, 211 p., \$4.50. Pioneering classics (1901, 1905) on mobs and manners, with less important illustrative detail eliminated.

SPACEPORT U.S.A.: The Story of Cape Canaveral and the Air Force Missile Test Center—Martin Caidin—*Dutton*, 380 p., illus., \$4.95. Only a decade ago a near wilderness of sand and scrub, the 15,000-acre Cape is today the laboratory of the space age, the launching site of missiles and satellites.

STABILIZATION OF SOIL WITH CALCIUM CHLORIDE: Annotated Bibliography 24—Floyd O. Slate and A. W. Johnson—*Highway Res. Bd.*, 96 p., paper, \$2.

THE STORY OF THE PLANT KINGDOM—Merle C. Coulter, rev. by Howard J. Dittmer—*Univ. of Chicago Press*, rev. ed., 326 p., illus., \$5. Classic botany textbook reorganized to include developments of modern botanical research and taxonomy.

SYMBOLIC LOGIC AND INTELLIGENT MACHINES—Edmund C. Berkeley—*Reinhold*, 203 p., \$6.50. Practical explanation of the principles, methods and purposes of symbolic logic and (Continued on p. 350)

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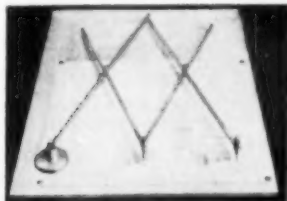
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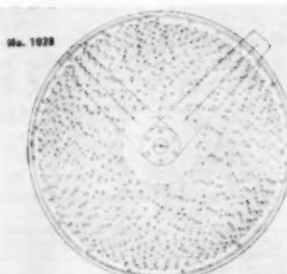
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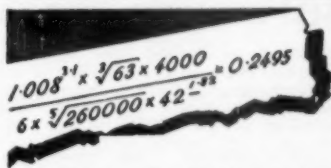
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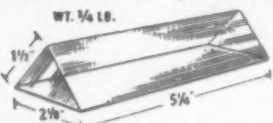


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Books of the Week

(Continued from p. 349)

Boolean algebra, on which the programming of intelligent machines is based.

THERMODYNAMICS—Gordon J. Van Wylen—Wiley, 567 p., illus., \$7.95. Textbook for engineering students with rigorous treatment of fundamentals.

TRIGONOMETRIC SERIES, Vols. I and II—A. Zygmund—Cambridge Univ. Press, 2nd ed., 383 and 354 p. resp., \$15 each, \$27.50 set. Revision takes account of recent work in Fourier series and related branches of pure mathematics, topics are treated in greater detail than before.

THE WORLD OF CAVES—Anton Lubke, transl. from German by Michael Bullock—Coward-McCann, 295 p., illus., \$5. Describes what speleologists find in the dark cavities of the earth, and their geological and historical significance.

Science News Letter, May 30, 1959

EDUCATION

NSF Sponsors Students In Basic Research

SOME 2,000 undergraduates will be taking part in "real" scientific research beginning this summer.

Grants totaling \$1,700,000 have been awarded to about 200 colleges and universities throughout the country. This represents an attempt to "capture the teachable moment when the young undergraduate shows early interest in scientific research," Dr. Alan T. Waterman, director of the National Science Foundation, said. The NSF is supporting the new Undergraduate Research Participation Program.

A list of the institutions receiving grants is available from the NSF, together with program dates and directors. Inquiries about specific programs should be addressed to the appropriate director, not to the Science Foundation.

Science News Letter, May 30, 1959

Questions

ASTRONOMY—Where is the device located that makes it possible to record distant stars' ultraviolet light? p. 341.

INVENTIONS—What are some of the nation's most wanted inventions? p. 343.

PUBLIC HEALTH—How great an increase in the number of paralytic polio cases was there in 1958 compared with 1957? p. 339.

Photographs: Cover, Chas. Pfizer & Co., Inc.; p. 339, Curtiss-Wright Corporation; p. 341, Allen Long; p. 343, Harvard University; p. 352, Baby Bathinette Corp.



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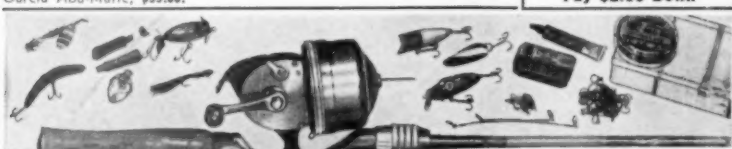
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The new \$34.95 Garcia Mitchell 306 is the new, smaller model of the salt water Mitchell. Perfect for muskies, stripers, steelheads, etc. State whether you cast with right or left hand. Mitchell 306 Reel with \$40.00 H-I Dymazon Deluxe Rod in heavier Magnum-X action, plus Aluminum case and cloth bag, \$74.95 Retail Value, **\$36.99** All for Only...
Sole Price of above Dymazon Rod in your choice of standard Magnum action or heavier Magnum X action and Aluminum Case with \$38.50 Retail Alcedo 200 Reel is only \$39.99; ... with \$20.50 Quick Flashes 280 Reel is only \$35.50; ... with \$23.00 Grete 100 is only \$29.99. Flashes and Grete Reels available for right or left hand.



CATCH MORE FISH, EASIER

Save \$26.91 on complete spin-cast outfit! Reel, rod and lures are balanced for smooth, effortless casting. Outfit includes \$12.95 Zebco 46 Spin-Cast reel, with 6 lb. monofilament line; \$24.95 H-I Imperial Magnum tubular power-glass rod plus a \$9.00 Spin-Kit loaded with seven proven lures, pocket tackle box, extra line, swivels, hooks, reel grease and accessories. State choice of 5 1/2 ft. rod with 1-pc. shaft or 6 1/2 ft. with 2-pc. Above rod and kit with \$19.50 Zebco 33 reel, \$24.89; ... with \$19.95 Shakespeare 1775 reel, \$24.99; ... with \$22.95 Shakespeare 1794 reel, \$28.88; ... with \$17.95 Johnson Century reel, \$23.89; ... with \$29.75 Garcia Abu-Matic, \$33.88.



\$24.95 Reel \$24.95 Rod
\$10.00 Spin-Kit

SHAKESPEARE & H-I SPINCAST OUTFIT

Now, a complete spin-cast outfit at a bargain price! Includes Shakespeare's newest and finest large capacity Model 1797 "Pushbutton" Wonder reel. Casts spinning lures or heavier baitcasting lures for larger fish in open or weedy waters. Level-wind, smooth micro-drag, golden-bronze finish. Comes with 12 lb. Monofilament line. H-I Imperial Custom Rod in "Magnum-X" action balances with reel. Rod is tubular power-glass in your choice of 5 1/2 ft. with 1-pc. shaft or 6 1/2 ft. with 2-pc. shaft. Complete \$10.00 Spin Kit includes seven proven lures including 4 plugs, spoon, spinner and jig, extra line, pocket tackle box and all needed accessories.

Sale price of above rod and spin-kit with \$29.95 South Bend Norseman Reel is only \$33.99; ... with \$22.95 Johnson Citation Reel, only \$28.77; ... with \$45.00 Ambassador 5000 Reel, \$44.95.



NYLON AIR MATTRESS—LIGHT COMFORTABLE, DURABLE MADE FOR U. S. GOVT.!

Every 100% DuPont Nylon Air Mattress is brand new & pressure tested at factory, airtight. Weight only 23 1/2 lbs. Highly abrasive resistant Nylon closely woven fabric, double coated with rubber. Occupies half the space of ordinary mattresses when deflated and folded. Comfortable 6 ribbed air compartments give firm support. Inflates without pump. Inflated size 35" x 73". Fits all standard sleeping bags. Low sale price because of tiny irregularities, perfectly factory repaired.
Save! Nylon Air Mattress and Celacold "Viking Deluxe" Sleeping Bag—Illustrated You get both the \$18.50 Nylon Air Mattress and a \$25.00 Sleeping Bag insulated with 4 lbs. of virgin Celacold—light and warm, non-allergic and mildew-proof. Outer resilient balloon-type poplin. Sanitized suede flannellette lining. Full zipper on side and across bottom. Air mattress pocket. Finished size 35" x 75 1/2"; weighs only 8 lbs.
AIR MATTRESS AND SLEEPING BAG, ONLY \$19.95

Cost Govt.
\$18.50 ea.
788 SALE PRICE!
Air Mattress
2 for \$14.95 4 for \$28.95
\$19.95

ALCEDO MICRON REEL and WORLD'S LIGHTEST SPINNING ROD!

World's lightest precision made rod and reel combination! \$41.50 tiny Alcedo Micron weighs only 6 1/2 oz., has ball bearings, helical gears and apte line guide. \$35.00 Continental "Superlite" Alcedo Rod, designed especially for the Micron, weighs only 17 1/2 oz., 2-pc., 5 1/2 ft. black tubular glass shaft. Cost Retail \$41.50
KLEIN'S SALE PRICE \$45.90



CLEARANCE! \$40.00 H-I MAGNUM CUSTOM SPINNING and FLY RODS BRAND NEW, FIRST QUALITY!

Every Rod in a Deluxe Aluminum Case. Extraordinary saving made possible on these \$40.00 1958 Model H-I Dymazon Magnum Rods only because of a recent minor change in rod trim. Every rod is brand new, finest tubular power-glass in Magnum design to handle a complete range of lure weights. 2-section shaft, finest fittings and finish. Each rod in a lifetime aluminum case with fabric bag. State choice of 7-ft. Spinning Rod in medium or "Sturdy-Action" or 8 1/2 ft. trout-bait action Fly Rod. ...
COST RETAIL \$40.00
KLEIN'S CLEARANCE PRICE \$14.99



SHAKESPEARE & HORROCKS IBBOTSON COMPLETE FLY OUTFIT

Best quality, lowest price ever for a complete fly casting outfit! \$13.00 Shakespeare Model 1837 free stripping, large line capacity automatic fly reel. \$25.00 Horrocks-Ibbotson Imperial Magnum tubular power-glass 2-pc. rod in your choice of 8 1/2 ft. trout-bait action or 7 ft. bass action. \$8.00 fly casting accessory kit including H-I floating fly line, line conditioner, leaders and a line assortment of poppers, flies and streamers for panfish, bass and trout all in a handy transparent box. Cloth rod bag included.
Sale price of above reel and kit with H-I \$40.00 Dymazon Magnum 8 1/2 ft. Fly Rod with Aluminum Case is only \$28.95.

Cost Retail
\$45.95
19.95 SALE PRICE
PAY \$2.00 DOWN

SALE!

MITCHELL & H-I HEAVY DUTY OUTFIT

CATCH MORE & BIGGER FISH WITH THIS GREAT NO-BACKLASH SALT WATER OUTFIT! The \$37.50 Mitchell Model 302 is the performance proven, trouble-free reel wanted by experienced salt water fishermen. When combined with the perfect balance of the \$40.00 H-I Imperial Rod you get performance unmatched anywhere... at any price. This 9 1/2 ft., 2-pc. heavy duty power-glass rod has 1 3/4" cork handle and 4 1/2" cork foregrip. Custom built with top quality fittings throughout. State whether you cast with right or left hand. Above rod and kit. \$39.95 Shakespeare 2080 Heavy Duty Reel, both only \$40.88.

CAN'T BACKLASH!
Cost Retail
\$77.50
38.88 SALE PRICE
PAY \$3.80 DOWN

NEW! Send 25¢ for KLEIN'S Bargain Sports Catalog containing hundreds of great values in fishing tackle, camping, new and used Guns, etc. Ready War 5¢. Catalog Free with all mail orders. See items in this ad NOT included in catalog.

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Ship Rush.

I understand my money will be refunded in full if I am not 100% satisfied after my full 30 days FREE TRIAL.

CASH CUSTOMERS:

☐ Send check or M.O. in full or 20% on C.O.D. Add only \$1.00 per order, any size, for postage and insurance.

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☐ My credit order with 10% or more down payment is enclosed.

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☐ My credit order with 10% or more down payment is enclosed. Rush application for KLEIN'S CREDIT CARD

KLEIN'S CREDIT TERMS:

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Note: You can also charge purchases with your American Express or other accredited charge card or plate.

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New Machines and Gadgets

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NYLON TYPEWRITER RIBBONS give sharper impressions, are stronger and last longer than conventional ribbons. Their high strength permits a thinner ribbon, so nearly three times as much ribbon may be coiled on a standard spool. The lint-free fabric helps keep the type face from clogging.

Science News Letter, May 30, 1959

HOLE-CUTTING TOOL for attachment to acetylene cutting torches permits cutting of precision holes in thick metal plates. Circular holes one-half inch to 12 inches in diameter may be cut by turning a crank. Odd shapes of many sizes may also be formed.

Science News Letter, May 30, 1959

PICTURE-FRAME SAVINGS BANK is a combination plastic frame, $5\frac{1}{2}$ by $6\frac{1}{2}$ inches, and $1\frac{1}{4}$ -inch-deep steel bank, attached vertically to the back of the frame by a piano hinge. The top of the bank has a coin slot and the back has a steel door and key. The frame may be hung on a wall or placed on a table top by means of an easel.

Science News Letter, May 30, 1959

BABY TUB OF polyethylene plastic, shown in the photograph, is designed to fit many standard bathinette frames. It can be



used in the frame for bathing baby, or used on any flat surface in kitchen or bath. When baby outgrows the tub, it may be used as laundry basket or wash basin.

Science News Letter, May 30, 1959

PLASTIC MEASURING DEVICE combines all measuring gauges into one, eliminating separate kitchen measuring spoons and cups. The device is a rectangular scoop with a channel handle which is fitted with

a movable measuring stick. The stick has various markings for required amounts of liquids or solids.

Science News Letter, May 30, 1959

PHOTOELECTRIC GLOSSMETER measures gloss of papers, paints, plastics, waxes, floor coverings, and textile yarns, fibers and fabrics. Optical and electrical units are in separate housings connected by a cable, enabling the meter to be used in various ways and positions.

Science News Letter, May 30, 1959

GUN STORAGE KIT consists of a transparent polyethylene bag and two rust inhibitor discs. The discs are tied to trigger guard and the center of the barrel after the gun has been cleaned and oiled. They release chemical vapors that inhibit rust. The bag seals the gun in moisture-free air.

Science News Letter, May 30, 1959

ASTRONOMICAL COMPASS for hobbyists, students and star gazers can be rotated through 60-degree angles along its calibrated degree scale. It may be used to solve simple surveying problems, teach celestial coordinates, foster understanding of star positions, and determine approximate position on earth or the true heading of airplanes.

Science News Letter, May 30, 1959



Nature Ramblings



By HORACE LOFTIN

FROM THE TINY MOLE that plows a hill across a well-kept lawn to the hefty armadillo of Africa, an impressive number of mammals have become adapted to digging for a living.

The armadillo, or earth pig, can tear into the hard-packed earth with his oversized front claws faster than a crew of shovelers can uncover him. Prairie dogs use an elaborate system of tunnels and chambers which they dig out as a secure home, from which they forage for food. Ground squirrels, woodchucks and kangaroo rats likewise are accomplished diggers; but these, too, spend a considerable amount of time above ground.

In the United States, only two groups of mammals, the moles and the pocket gophers, spend the great majority of their lives under the ground. These animals find their food, mate, rear young and pass practically all of their life in their subterranean

Life Down Under



homes and may never see the light of day.

It is not surprising, then, that moles and pocket gophers show marked structural changes which aid in their life of perpetual digging. Of what use is an eye to a mole? Little or none. The eyes are reduced in size (protecting them from the dirt) or even sealed over in one mole. Pocket gophers have small, weak eyes, and copiously flowing tear glands to keep them cleansed. External ears, too, are more of a hindrance

than a help. These have all but disappeared.

Since their principal occupation is digging, the front limbs of both animals are short, stout and very strong, armed with efficient claws. Their main musculature is concentrated forward in their body to furnish the strength needed for digging, and the bones of the shoulder and arms are well developed.

On the other hand, the hind limbs are reduced in size, the "hip" being quite small to allow freedom of movement in the tunnels. The tails of these animals are usually very sensitive. The reason becomes clear when you consider that the pocket gopher can travel about as fast backward through his tunnel as forward!

The hair of the mole lacks a "grain." That is, it lies forward as easily as backward, so that it does not present an obstacle in moving in either direction in a narrow tunnel—and it keeps the dirt out. It is this velvety quality that makes mole-skin so valuable in the fur trade.

Science News Letter, May 30, 1959

